CTC Union Technologies Co., Ltd.

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Quick Installation Guide

IGS-402SW-4PB(E)

Industrial Grade Web Managed Gigabit 802.3bt PoE++ Switch

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Version 1.0 September, 2023

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WARNING:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause harmful interference in which case the user will be required to correct the interference at his own expense. NOTICE: (1) The changes or modifications not expressively approved by the party responsible for compliance could void the user's authority to operate the equipment. (2) Shielded interface cables and AC power cord, if any, must be used in order to comply with the emission limits.

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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Introduction

IGS-402SW-4PB(E) are industrial grade managed PoE switches with 4 10/100/1000Mbps RJ-45 ports and 2 100/1000Mbps fiber optic slots. PoE technology describes a system to pass electrical power safely, along with data, on Ethernet cabling. The original IEEE 802.3af-2003 PoE standard provides up to 15.4W of DC power to connected devices. The updated IEEE 802.3at-2009 PoE standard also known as PoE+ or PoE plus, provides up to 30W of power. It is worth mentioning that IGS-402SW-4PB(E) can provide up to 90W power through the use of all 4 pairs of category 5e (or above) cable. Thus, IGS-402SW-4PB(E) are ideal products for applications that need more power budget.

Housed in a rugged DIN rail or wall mountable enclosure, this product is designed for harsh environments, such as industrial networking, intelligent transportation systems (ITS) and is also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications.

Package List

- IGS-402SW-4PB(E) device
- DIN rail bracket with screws
- Terminal block for power inputs
- Protective cap for SFP slots

Features

- Provides 4-port IEEE 802.3af/at/bt PoE++ output
- The total PoE output power budget of the device is 240W (Maximum 90W per port)
- DC input power 48VDC (44~57VDC)
- Redundant dual power inputs
- IP30 rugged metal housing
- Fanless design
- Supports wide operating temperature range -40°C~75°C

Access to Command Line Interface (CLI)

All IGS-402SW-4PB(E) switches have a USB Type-C™ connector on the front panel which may be connected to a host computer for accessing Command Line Interface (CLI). If your host computer has a USB Type-C™ port, use a USB Type-C™ to USB Type-C™ cable to connect the IGS-402SW-4PB(E) to the host. If the host has a regular USB Type-A™ connector (USB® v1.0, v2.0, v3.0), then use a standard USB Type-A™ to USB Type-C™ adapter cable to connect the IGS-402SW-4PB(E) to the host computer.

Console Connection

Use the appropriate cable to connect the "CONSOLE" port to the PC terminal communications port. Run any terminal emulation program (HyperTerminal, PuTTY, TeraTerm Pro, etc.) and configure the communication parameters as follows:

Speed: 115,200
Data: 8 bits
Parity: None
Stop Bits: 1
Flow Control: None

From a cold start, the following screen will be displayed. At the "Username" prompt, enter "**admin**" with **no password**.

```
Press ENTER to get started

Username: admin
Password:
#
```

To change the default IP address to your desired one (for example, 192.168.0.10/24), issue the following commands:

```
#
# config terminal
(config)# interface vlan 1
(config-if-vlan)# ip address 192.168.0.10 255.255.255.0
```

For complete CLI operation, please refer to the operation manual.

Telnet/SSH Connection

To use Command Line Interface (CLI), you can also choose to access the device through a Telnet/SSH connection via TCP/IP network over Ethernet ports. For initial operation, use the default TCP/IP settings (10.1.1.1) to login to the device.

Default TCP/IP settings:

IP Address: 10.1.1.1
Subnet Mask: 255.255.255.0
Username: admin
Password: No password (Press "Enter" key)

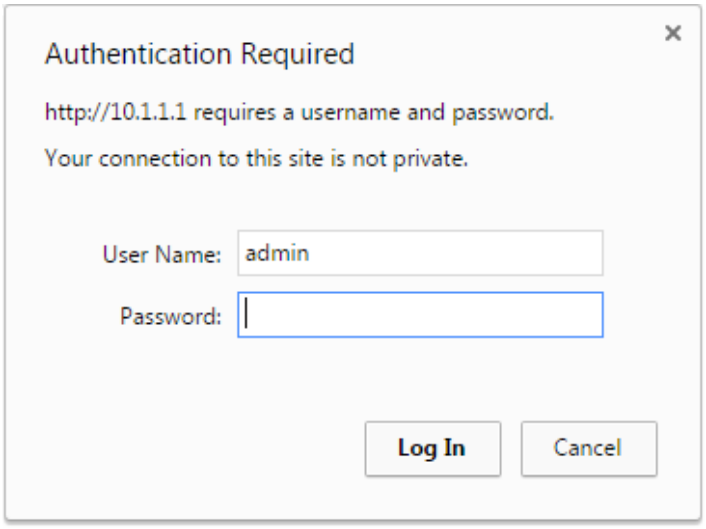
To change the default IP address to your desired one (for example, 192.168.0.10/24), issue the following commands:

```
#
# config terminal
(config)# interface vlan 1
(config-if-vlan)# ip address 192.168.0.10 255.255.255.0
```

Once the desired IP address has been configured, a web browser can be accessed and used to configure the device through a more easy-to-use GUI (graphical user interface). For complete CLI operation, please refer to the operation manual.

Access to Web-Based Management Interface

To enter the web-based management interface for the first time or after returning the device back to factory defaults, input the default IP address "**10.1.1.1**" in your favorite web browser. Then, a standard login prompt will appear depending on the type of browser used. The example below is with Firefox browser.



Enter the factory default username "**admin**" with **no password**. After successfully entering the web-based management, the Port State page will appear. For complete Web GUI operation, please refer to the Operation User Manual.

Specifications

Ethernet Interface

- Standards: IEEE 802.3, IEEE 802.3u, IEEE 802.3ab
- Connector: RJ-45 (shielded)
- Number of Ports: 4
- Speed: 10/100/1000Mbps
- Cable: Category 5e or above (twisted pair cable)

Optical Interface

- Standards: IEEE 802.3u, IEEE 802.3z
- Connector: SFP slot
- Number of Slots: 2
- Speed: 100/1000Mbps

Switch Features

- Store & Forward Switching
- Supports IEEE802.3x Flow Control
- Auto Negotiation
- Auto MDI/MDI-X
- Duplex: Full/Half (Auto-negotiation per IEEE802.3u)
- Switching Fabric: 12Gbps (Non-blocking), Full wire speed
- Memory Buffer: 220K Bytes for packet buffer
- Device Memory: 128M Bytes Flash ROM, 256M Bytes RAM
- MAC Table: 4K
- Jumbo Frame: 10K

Power

- DC Input Power: 48VDC (44~57VDC)
  - 54~57VDC is recommended for 90W (4 Pairs) PoE applications
  - 52~57VDC is recommended for 60W (4 Pairs) PoE applications
  - 52~57VDC is recommended for 30W (2 Pairs) PoE applications
  - 44~57VDC is recommended for 15.4W (2 Pairs) PoE applications
- Supports redundant dual power inputs
- Supports power input reverse polarity protection
- Connector: removable 4-pin terminal block
- Power Consumption:

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
57VDC	254W	9W	240W

Power over Ethernet

- Supports IEEE 802.3af (15.4W), IEEE 802.3at (30W), IEEE 802.3bt (90W)
- End-Span, Alternative A and B mode
- 4 pairs, 90W/per port, total 240W power budget
- PoE Pin Assignments:
  - Positive (V+) Pins: RJ-45 Pin 1, 2, 4, 5
  - Negative (V-) Pins: RJ-45 Pin 3, 6, 7, 8

Mechanical

- Fanless design
- Water & Dust Proof: IP30 protection
- Dimensions: 106 mm (D) x 38.6 mm (W) x 152 mm (H)
- Mounting: DIN-Rail mounting, Wall mounting (Optional)
- Weight: 635g

Environmental

- Operating Temperature: -10°C~60°C (IGS-402SW-4PB); -40°C~75°C (IGS-402SW-4PBE)
- Storage Temperature: -40°C~85°C
- Humidity: 5%~95% (Non-condensing)

Certifications

- EMC: CE (EN55032, EN55035)
- EMI (Electromagnetic Interference): FCC Part 15 Subpart B Class A, CE
- EMS (Electromagnetic Susceptibility) Protection Level:
  - EN61000-4-2 (ESD) Level 3, Criteria B
  - EN61000-4-3 (RS) Level 3, Criteria A
  - EN61000-4-4 (Burst) Level 3, Criteria A
  - EN61000-4-5 (Surge) Level 3, Criteria B
  - EN61000-4-6 (CS) Level 3, Criteria A
  - EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
- Surge Protection: 4KV for PoE, UTP and fiber ports
- Shock: IEC 60068-2-27
- Freefall: IEC 60068-2-32
- Vibration: IEC 60068-2-6

MTBF (MIL-HDBK-217)

- 772,953 hours

Panels

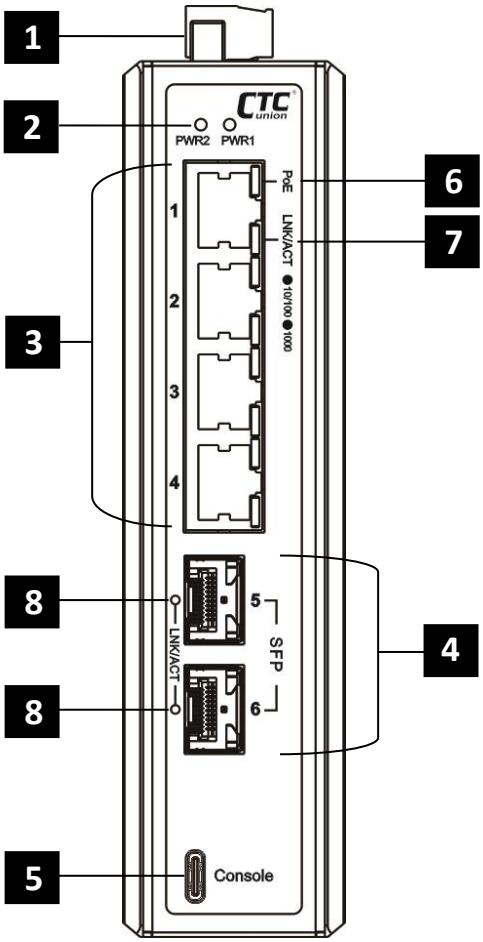


Figure 1. Front Panel

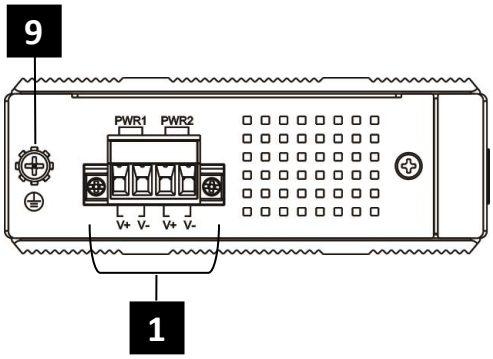


Figure 2. Top Panel

No.	Description
1	Power terminal block
2	Power 1 & 2 LED indicators
3	LAN RJ-45 connectors
4	Fiber slots
5	USB Type C console port
6	PoE LED indicator
7	LAN Link/Activity LED indicator
8	SFP Link/Activity LED indicator
9	Earth ground sign

LAN & Fiber Port

IGS-402SW-4PB(E) switches have four electrical LAN ports and two SFP-based fiber ports on the front panel. The LAN ports (numbered 1~4) that utilizes shielded RJ-45 connector support 10/100/1000Mbps speed and PoE function; while the fiber ports support dual rate 100/1000Mbps speed.

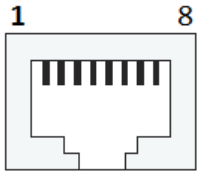
Power over Ethernet (PoE)

The four LAN ports support PoE per IEEE802.3af (15.4W), IEEE802.3at (30W) or IEEE802.3bt (90W) for connection to a standard PoE PD (Power Devices) such as IP Cameras, Access Points, IP Phones, Digital Signage, etc. PoE eliminates the need to run separate power to these devices thereby simplifying deployment and reducing expenses.

The four LAN ports may also connect to any non-PoE device for normal Ethernet transmission without any damage to the non-PoE device or to this device.

Note: *By default, PoE function is disabled. If you want to use PoE function, please enable this function via Web (GUI) operation. For detailed descriptions on Web (GUI) operation, please refer to the Operation User Manual.*

RJ-45 Ethernet Port Pinouts



RJ-45 Ethernet & PoE Pin Assignments

Pin No.	RJ-45 Ethernet		PoE Output
	100M	1000M	
1	RX+	TRD 0+	V+
2	RX-	TRD 0-	V+
3	TX+	TRD 1+	V-
4	-	TRD 2+	V+
5	-	TRD 2-	V+
6	TX-	TRD 1-	V-
7	-	TRD 3+	V-
8	-	TRD 3-	V-

Recommended Power & Ground Wiring Scheme

Power Connection

IGS-402SW-4PB(E) switches are powered up by an external power supply. On the top panel, a removable 4-pin terminal block is provided for two pairs (PWR1 & PWR2) of DC power connection. To connect to the power supply, insert V+ and V- wire into power contacts. Then, tighten the wire-clamp screws to prevent power wires from loosening. If the power supply is connected correctly, then the PWR LED on the front panel will light in green.

Earth Ground Connection

An earth ground connector is provided on the top panel with an earth ground sign next to it. Grounding the device can help to release leakage of electricity to the earth safely so as to reduce injuries from electromagnetic interference (EMI).

Prior to connecting to the power, it is important to connect the ground wire to the earth. Follow steps below to install ground wire:

1. Remove the ground screw.
2. Attach the ground screw to the ring terminal of the grounding cable. Make sure that the ground cable is long enough to reach the earth.
3. Use a screwdriver to fasten the ground screw.

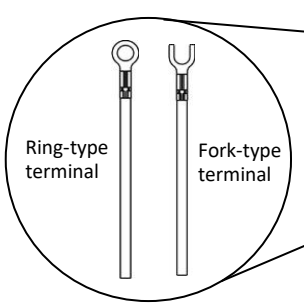


Figure 3. Ground Cable Types

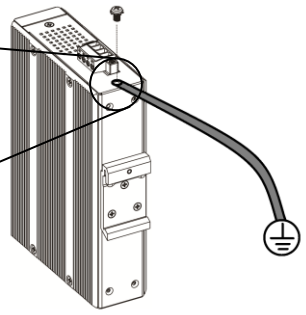


Figure 4. Ground Connection

LED Indicators

LED	Color	Status	Description
PWR 1 PWR 2	Green	On	Lit if power is connected and active.
		Off	Power is not connected.
LAN LNK/ACT	Amber	On	The connected LAN speed is 1000M.
		Blinking	Blinking when there is Ethernet traffic.
		Off	The LAN link is down or disabled.
	Green	On	The connected LAN speed is 10/100M.
		Blinking	Blinking when there is Ethernet traffic.
		Off	The LAN link is down or disabled.
SFP	Green	On	The fiber optic link is up.
		Blinking	Blinking when there is Ethernet traffic.
		Off	The fiber optic link is down.
PoE	Green	On	PoE LED indicator is lit and remains steady on when the LAN port has successfully negotiated PoE and is supplying output power to the remote connected PD.
		Off	No PoE power output.

Installation

IGS-402WS-4PB(E) can be installed in DIN rail or mounted on wall (optional). Hardware brackets for DIN rail installation are provided with the device. However, wall-mounting brackets are not provided. If you need wall-mounting installation kit, please contact your sales representative. When installing the DIN rail and wall-mounting bracket, be sure to correctly align the orientation pin.

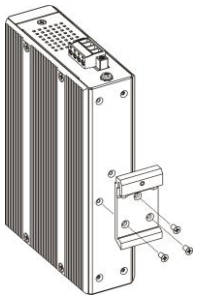


Figure 5. DIN Rail

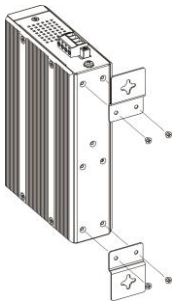


Figure 6. Wall Mounting

IGS-402WS-4PB(E) with DIN Rail bracket have a steel spring in the upper rail of the bracket. This spring is compressed for mounting and un-mounting by applying downward force.

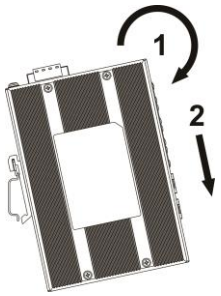


Figure 7. Mounting

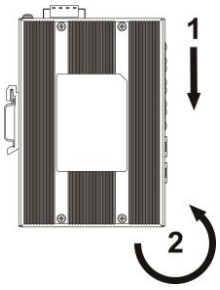


Figure 8. Un-mounting